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SHORT REPORT

Stentgraft Exclusion of Asymptomatic Popliteal Artery Aneurysms—Medium Term Results

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Feasibility studies show that successful exclusion of popliteal artery aneurysms using stentgrafts is possible.
***Purpose of the Study**: Prospective study to evaluate the medium term results after stentgraft exclusion of popliteal artery aneurysms above and below the knee.*
***Setting**: Tertiary referral centre, community hospital.*
***Material and Methods**: Patients with asymptomatic popliteal artery aneurysms were included into the study. Exclusion criteria: Symptomatic and thrombosed aneurysms. All patients were treated with Wall grafts or Passenger grafts.*
***Results**: 25 grafts were percutaneously implanted. There were no major intra- or postprocedural complications and a 100% technical success rate. The median 30 months cumulative patency rate was 75% for above-knee grafts and 27% for below-knee grafts ($p < 0.002$).*
***Conclusion**: Stentgraft exclusion can be performed with a low complication rate and with good intermediate term results in asymptomatic above-knee popliteal artery aneurysms. Routine use can not be recommended for below-knee aneurysms.*

Key Words: Popliteal aneurysm; Stent graft.

Bypass surgery and popliteal aneurysm exclusion can be performed with excellent long term results.[1–3] Yet there is an increasing number of feasibility studies describing short term results after stentgraft exclusion of symptomatic or asymptomatic popliteal artery aneurysms.[4]

In a larger series of patients we wanted to evaluate the longer term results of endovascular surgery distinguishing between above and below the knee popliteal artery aneurysms.

Material and Methods

After informed consent was obtained all patients admitted with popliteal artery aneurysms between October 1999 and October 2002 were prospectively enrolled into this study. The inclusion criterion was the existence of an asymptomatic aneurysms in patients with at least a 2 vessel crural runoff. All patients presenting with acute or chronic ischemia, completely thrombosed aneurysms or blue toe syndrome were excluded. All popliteal aneurysms were classified as a above- or below- knee aneurysms according to their anatomical location. During the study period we did not see popliteal artery aneurysms extending into the tibial arteries. This would have been another exclusion criterium.

All stentgrafts were placed using percutaneous antegrade puncture of the common femoral artery. During the study period there were 2 additional patients who presented with ischemia and who were originally scheduled for surgery and in whom distal perfusion deteriorated during preoperative lysis therapy. In these 2 cases a stentgraft was placed and lysis was successfully continued. In all cases an 8 or 10 mm diameter stentgraft (Wallgraft 9 cases, Passenger graft 6 patients, both devices Boston Scientific, Mass, USA). All patients received 300 mg of aspirin postoperatively for an indefinitive period. Postoperatively all patients were prospectively studied with duplex ultrasound at 3 month intervals.

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Results

During the study period 25 grafts were implanted in 25 patients with a mean diameter of 24 ± 4 mm. In 16 cases an above the knee aneurysm was excluded and in 9 patients the landing zone for the stentgraft was below the knee (Fig. 1(A) and (B), and Fig. 2(A) and (B)). There were no major procedure-related complications. One patient had an increased temperature for 5 days post implantation. In 3 patients a groin hematoma was treated conservatively. Postoperative colour coded duplex examination did not reveal any type I or type II endoleak. Graft patency rate was statistically significantly different for above-knee aneurysms compared to below-knee aneurysms ($p < 0.002$, log rank test). One of the above-knee grafts thrombosed after 6 weeks. The median 30 months cumulative patency rate was 75% for above-knee grafts. For the below-knee grafts 6 out of 9 cases suffered early thrombosis with a cumulative patency rate of 27%. In 2 cases with thrombosed below-knee grafts, a femoropopliteal bypass was performed for claudication.

Discussion

There is little distinction between above and below-knee aneurysms in most papers published on endovascular exclusion of popliteal artery aneurysms. According to our intermediate term results a below-knee landing zone is associated with a significantly poorer long term patency rate compared to above-knee aneurysms. Although there were no cases of device failure we assume that the flexing movements of the knee joint are responsible for early graft thrombosis in most cases. There may be an indication for stent graft placement in symptomatic cases who deteriorate during thrombolysis. After stent graft placement thrombolysis can be resumed successfully.

In contrast to other endovascular procedures patients did not progress to critical ischemia when endovascular treatment had failed.[5] Surgical therapy is still the gold standard and we must compare novel treatment options to the results of bypass grafting with and without lysis.[6] Surgical results are presented comparing asymptomatic cases to patients with ischemic complications rather than just the anatomical location.[7,8] Therefore a prospective study including asymptomatic patients with above-knee aneurysms treated with endovascular devices versus surgical therapy is required to evaluate the role of stent grafts in the treatment of popliteal artery aneurysms.

Our results do not yet justify the use of endovascular aneurysm exclusion in patients with ischemic complications outside the study protocols.

Conclusion

Good intermediate term results can be achieved after endovascular exclusion of asymptomatic above-knee aneurysms. Long term results may perhaps be expected with new drug eluting stentgrafts and devices which better tolerate flexing of the knee joint.

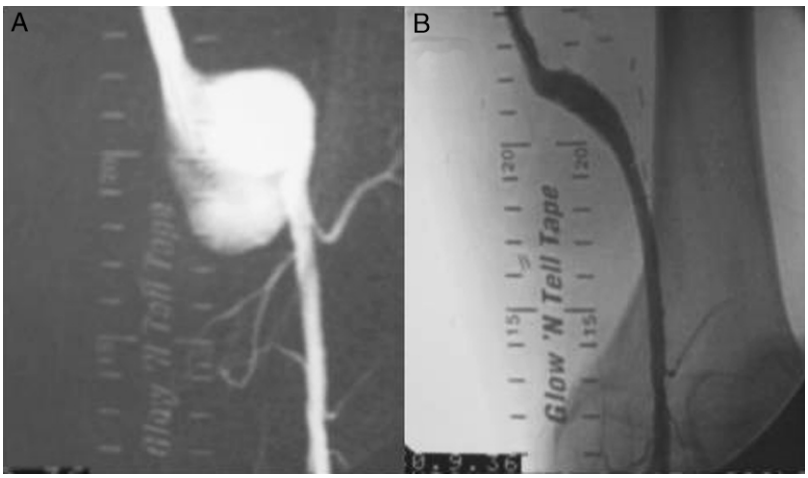

Fig. 1. Above the knee popliteal artery aneurysm before (A) and after stentgraft exclusion (B). The saphenous vein was no longer available after aorto-coronary bypass surgery.

Fig. 2. Distal landing zone close to the tibial peroneal trunk. Before (A) and after (B) stentgraft placement. The aneurysm extends to below the knee. After implantation the stentgraph crosses the knee joint

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